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## Development of Strawberry Farming in Central Java

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### ABSTRACT

*This research aims to know the farming expense, revenue, income, feasibility and competitiveness of strawberries enterprises in Serang Village sub-district of Purbalingga Karangreja. The basic method of this research is descriptive analysis. The location was purposely determined in Serang Village at Karangreja District, Purbalingga appropriate research purposes. Serang Village Purbalingga was chosen as the location because the production of Strawberry in Purbalingga is the highest among the other regions of producing strawberry in Central Java. The sampling method for the farmers used stratified random sampling with 40 farmers as respondents based on farmer's strata of the land. The data used are primary data and secondary data. The data analysis method used is the analysis of farming, the circulation of B/C ratio, and Domestic Resource Cost (DRC) analysis to determine strawberry competitiveness in purbalingga by comparative and competitive advantage. The result showed that the average total cost of farming expense in Serang is Rp18,456,217 per farming per season. The average farmers revenue is Rp39,081,320 per farming per season. The average farmers income is Rp20,625,102 per farming per season. The statistic of farming feasibility is 1.12 which means strawberry farming in Serang is profitable. Strawberry farming in Serang has comparative advantage which Domestic Resource Cost is Rp 6,013.43. Strawberry farm at Desa Serang showed that the comparative and competitive advantage is 0.42 and 0.44 which means that strawberry farming is financially an economically efficient and competitive in international market. This indicates that the domestic demand is more profitable if supplied by domestic production rather than import.*

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## Preface

Indonesia is known as an agrarian country which means a country that rely on agricultural sector either as a livelihood or as a support for development. The agricultural sector is the third largest after the industrial sector and trade sector as the largest contributor of Indonesia economic growth. It makes the agricultural sector as a potential market for domestic products either for production or consumption, especially for products was produced by the food crop sub-sector, includ of horticultural agribusiness. The success of horticultural agribusiness is by selecting of commodities which has high economic value. Another thing to be considered in the selection of commodities is the potential possessed by the area of exploitation.

Horticultural products type was widely consumed by the people is the fruit. Fruits that have been widely developed or cultivated in various regions in Indonesia are strawberry fruit. In accordance of the strawberries development in Indonesia, Central Java is one of the Provinces are producing strawberries. Central Java Province consists of 29 districts where strawberry-producing areas in Central Java include Purbalingga regency, Wonosobo, Tegal, Magelang, Karanganyar and Pekalongan regency. Purbalingga regency has the biggest or highest strawberry production among the 6 (six) other strawberry producing districts at Central Java Province. However, the number of high production in a region, does not a guaranteed that a commodity has high competitiveness as well. Therefore, it is necessary for doing a research to know the competitiveness of strawberry fruits in Purbalingga Regency with good farming management which is expected to increase farmer income and prosperity.

## Research Methods

### The Analysis of Strawberry Farming

The quantitative data was tabulat-

ed and configured in the same unit on the farming analysis. According to Soekartawi (1995), the income of farming is the difference between the revenue by all the costs incurred. The income of Strawberry farming was obtained from the calculation as follows:

$$TL = Y.Py - \sum X_i . P_i$$

Description TL is Income of strawberry farming, Y is Strawberry production, Py is Price of Strawberries, Xi is The use of i-th factor, Pi is The Price of i-th Factor per unit

To find out the feasibility level of selected commodity farming was used R/C ratio analysis. The greater R / C ratio value of the farming system is more feasible to cultivate (Soekartawi, 1995).

### Determination of Featured Commodities

Determination of featured commodities was used Policy Analysis Matrix (PAM). This method is used to analyze the comparative advantage of a commodity which reviewed of the resources used to produce the commodities, result of output, the prevailing economic policies and the market distortions occur. The PAM method is summarized in Table 1

The various indicator of the superior commodity can be calculated on the table 1 as follows:

#### a. Private Profits

The privat profit was received benefit by farmers as producers of commodity. A commodity has an advantage which the value of private profits is positive.

$$\begin{aligned} \text{Privat Profit} &= \text{Privat Revenue} - (\text{Privat} \\ &\text{Tradable Input} + \text{Non-tradable Factor}) \\ &= D = A - (B+C) \end{aligned}$$

**Table 1**  
**Policy Analysis Matrix (PAM)**

Description	Revenue	Cost		Profit
		Tradable Input	Non-tradable Factor	
Privat Price	Private Revenue(A)	Privat Tradable Input (B)	Privat Non-tradable Factor (C)	Privat Profit $D = A - (B + C)$
Social Price	Social Revenue (E)	Social Tradable Input (F)	Social Non-tradable Factor (G)	Social Profit $H = E - (F + G)$
The impact of policy and Market Distortions	Output Transfers $I = A - E$	Input Transfer $J = B - F$	Transfer Factor $K = C - G$	Net Transfer $L = D - H$

Provenance: Monke dan Pearson, 1995

**b. Social Profits**

The Social profit was received benefit by a whole of the society from a commodity. A commodity has an advantage which the value of social profits is positive.

*Social Profit = Social Revenue - (Social Tradable Input + Social Non-tradable Factor)*

$$= H = E - (F + G)$$

**c. Domestic Resource Cost Ratio**

DRCR measures whether that domestic production or imported are more profitable. DRCR < 1 indicates that a commodity is more profitable if produced domestically, instead DRCR > 1 shows a less profitable commodity produced domestically.

*DRCR = Social Non-Tradable Factor (Social Recipients) - Social Tradable Input*  
 $= G / (E - F)$

**d. The Transfer of the Output (OT)**

The Output of the Transfer measure the impact of government policies and/or market distortions in a commodity. OT > 0 indicates that a commodity receives a positive impact from a government policy and/or market distortion.

*OT = Privat Revenue - Social Revenue*  
 $= I = A - E$

**e. Nominal Protection Coefficient Output (NPCO)**

The NPCO measures whether a commodity obtains protection from the government or does not receive it. NPCO > 1 indicates

that a commodity is not protected by the government.

*NPCO = Privat Revenue / Social Revenue*

**f. The Transfer of the Input (IT)**

IT was measures whether a farmers pay tradable inputs cheaper or more expensive than actual prices. IT > 0 was showed that farmers pay tradable inputs more expensive than they should, otherwise IT < 0 was showed that farmers paying tradable inputs that are cheaper than they should be pay.

*IT = Privat Tradable Input - Social Tradable Input*

$$= J = B - F$$

**g. Nominal Coefficient Protection Input (NCPI)**

NCPI measures whether tradable inputs get government protection or does not get it. NCPI > 1 indicates that tradable inputs does not protected by the government.

*NCPI = Privat Tradable Input / Social Tradable Input*  
 $= B / F$

**h. Transfer Factor**

FT measures whether farmers pay non-tradable factors cheaper or more expensive than actual prices. FT > 0 shows that farmers pay non-tradable factors more expensive than they should be pay and instead, FT < 0 indicates farmers pay non-tradable factors that are cheaper than they should be pay.

*FT = Non-tradable Privat Factor - Non-*

*tradable Social Factor*

$$= K = C-G$$

i. Net Transfer

NT was measures the profit of private benefits on the social benefits. NT > 0 indicates that farmers earn a bigger profit than it should, on the contrary when NT < 0 indicates that farmers earn profits that are smaller than they really are.

$$NT = \text{Privat Profit} - \text{Social Profit}$$

$$= L = D-H$$

j. Effective Protection Coefficient (EPC)

The EPC gauge whether producers of a

commodity was protected by the government or does not protected. EPC > 1 indicates that the producer obtains protection, while EPC < 1 indicates that producer does not get protection from the government.

$$EPC = (\text{Privat Revenue} - \text{Privat Tradable Input}) / (\text{Social Revenue} - \text{Social Tradable Input})$$

$$= (A-B) / (E-F)$$

### The Analysis of Farming

#### Analysis of Strawberry Farming

Strawberries is one of the fruits commodities that cultivated by the most of people in Serang village a side from vegetable commodities. The Samples of strawberry

**Table 2**  
**The social and Private Analysis of Strawberry Farming per m<sup>2</sup> at 2,131.25 in Serang Village 2016**

No.	Description	Privat (Rp)			Social (Rp)		
		Tradable	Non Tradable	Total	Tradable	Non Tradable	Total
	Cost Breakdown						
1	Depreciation of equipment	18.752	18.752	37.504	17.601	17.601	35.202
2	Means of production						
	a. Seeds	3.997.500		3.997.500	3.997.500		3.997.500
	b. Mulch	1.416.875		1.416.875	1.416.875		1.416.875
	c. Chemical Fertilizer		1.727.188	1.727.188		1.383.000	1.383.000
	d. Manure	540.250		540.250	540.250		540.250
	e. Organic fertilizer	125.775		125.775	125.775		125.775
	f. Pesticide		676.875	676.875		544.500	544.500
	g. Agricultural Medicines		126.375	126.375		101.100	101.100
3	Labour	9.031.250		9.031.250	8.070.550		8.070.550
4	Other Costs						
	a. Land Lease	687.500		687.500	687.500		687.500
	b. Property taxes	20.375		20.375	20.375		20.375
	c. Capital interest	68.750		68.750	68.750		68.750
	Total Cost			18.456.217			16.991.377
	Revenue			39.081.320			38.453.696
	Income			20.625.103			21.462.319
	R/C Ratio			2,117515198			2,2631301
	B/C Ratio			1,117515198			1,2631301

Provenance: Primary Data Analysis, 2016

farmers are strawberry farmers in Serang Village, at Karangreja District, Purbalingga. The result showed that the average farmers revenue is Rp39,081,320 of the cost average is Rp. 18.456.217. The privat R/C ratio analysis result showed 2.11 which mean that any expense cost of strawberry farming is Rp 100, will generate revenue to Rp 211. The privat B/C ratio analysis result showed 1.11 which mean strawberry farming in Serang is profitable. The value of R/C ratio and B/C ratio as private or social in Serang are both profitable, which showed that the result are bigger than 1 (one) (>1) (Table of 5.1). This value mean that strawberry farming in Serang are profitable for farmers and for society as a whole. In this case the community does not harmed by the existence of strawberry farming. Based on it, the cultivation of strawberry farming should be continue for increasing farmer's income and public prosperity at serang vilage in general.

The average land for strawberry farming in Serang is 2,131,25 m<sup>2</sup>, which the land area is forming of leasehold and own land. Strawberries were grown in monoculture, but some farmers plant it in intercropping with other vegetables such as leeks or cabbage. Especially on high rainfall and strawberry prices are in low position. In terms of farming cost, as much as 48.93% of allocated expenses as the cost of labor and 46.65% allocated for the means of production from the total cost incurred on strawberries farming. The production of strawberries at Serang was 37,165 kg per farming per season with an average production is 929.13 Kg. Strawberries are sold in fresh fruit to the collecting traders and distribute it to the market. Strawberries are sold at an average price of Rp. 41,387 per Kg.

#### Determinants of Excellent Commodities

The results of the Policy Analysis Matrix (PAM) of strawberry farming are il-

**Table 3**  
**Indicators Comparative Advantages of Strawberry Farming at Serang Village 2016**

Parameters	Revenue (Rp)	Cost (Rp)		Profit (Rp)
		Tradable Cost	Non Tradable Cost	
Privat Price	39.081.320	2.549.190	15.907.027	20.625.103
Social Price	38.453.696	2.046.201	14.945.176	21.462.319
Impact of policy and market distorsion	627.624	502.989	961.851	-837.216
Private Profit	20.625.103			
Social Profit	21.462.319			
Privat Cost Ratio (PCR)	0,43542567			
Domestic Resource Cost Ratio (DRCR)	0,41049723			
Output Transfer (OT)	627.624			
Nominal Protection Coefficient Output (NPCO)	1,01632155			
Factor Transfer (FT)	961.851			
Input Transfer (IT)	502.989			
Nominal Protection Coefficient Inpur (NPCI)	1,24581603			
Net Transfer (NT)	-837.216			
Effective Protection Coefficient (EPC)	1,00342333			

Provenance: Primary Data Analysis, 2016



illustrated in Table 5.2. Social profit of strawberry farming is smaller than privat profit. This indicates that there is no transfer from farmers to the community.

PCR of 0.43, was showed that the nontradable input is efficiently and has value-added for the farmers. DRCR of 0.41 was showed that the domestic demand is more profitable if supplied by domestic production rather than import. A positive OT (627,624) shows that farmers was received strawberry prices is higher than they should get. Nominal Protection Coefficient (NPC) is a ratio that shows the impact of the policy (and any market failure is not corrected by an efficient policy), so its causing the difference between the two prices (Input and output). NPCO was greater than 1 (1.01) showed that Strawberry farmers doesn't getting price protection from the Government. The positive FT (961,851) was showed that farmers payed non tradable inputs are more expensive than they should be pay. On the other hand, farmers also pay higher than they should be pay for tradable inputs (502.989). Protection for tradable input is 124%, indicated by NPCI value of 1.24. Overall, it can be concluded that strawberry farming hasn't received the protection, that was clearly showed by negative NT value (-837.261), although strawberry farming still gives the profit for the farmers, it was shown by the EPC value of more than 1, it is 1.003.

### Conclusion

Strawberry commodity farming has R / C ratio and B / C ratio above 1 in private and social farming analysis. This indicates that strawberry farming was profitable and there are no community was be aggrieved by farming activities.

The social profit of strawberry farming are greater than privat profit. This value mean that strawberry farming in Serang are profitable for farmers and for society as a whole. In this case the community does not harmed by the existence of straw-

berry farming. Based on it, the cultivation of strawberry farming should be continue for increasing farmer's income and public prosperity. Non tradable inputs have been used efficiently and provide added value to strawberry farmers. Domestic demand of strawberries are more profitable if met by domestic production rather than imports. Farmers was received strawberry price is higher than it should be. Strawberry farmers does not getting price protection from the government. Farmers was payed nontradable inputs are more expensive than they should be. On the other hand, farmers also pay higher for tradable inputs than they should. Overall, it can be concluded that strawberry farming has not received adequate protection, it was indicated by the negative NT value (-837.261).

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